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TEXTILE
CHEMISTRY
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OFFICIAL PUBLICATION
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Contents

Contents of previous issues can be found by consulting the Industrial Arts Index at your library

• Special Articles

The Printing of Wool 153
E. W. Pierce

Tracing Underground Water by Means of Dyes 169
F. R. Cozzens

• Departments

Technical Notes from Foreign Sources 157

Trade Notes—New Products 170

Book Reviews 174

• Editorials

New Capital and Unemployment 167

Knitting Arts Exhibition 167

• Proceedings of the American Association of Textile Chemists and Colorists

Calendar of Coming Events P159

One Hundred and Nineteenth Meeting of the Research Committee P160

A 1940 Review of the Inter-Society Color Council P160

Report of the A.A.T.C.C. Delegates to the Inter-Society Color Council P161

Meetings, New York Section P161

Membership Applications P162

Unemployment Register P164

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The Printing of Wool

E. W. PIERCE

VIGOREUX PRINTING

THE simplest and crudest form of wool printing, which has no counterpart in the case of cotton, but which is adapted to cut staple fiber, is vigoreux printing. The vigoreux print on slubbing is confined to one color at a time and is gauged according to the width of the printed stripe in comparison with the white, or unprinted portion. The equipment consists of a series of rolls having a face of raised stripes which run like a high pitched screw thread, making one turn around a two-foot cylinder of 6 or 8 inches diameter. Between the stripes, which average 1 inch in width, the open space is so proportioned that the roll is referred to as a 50-50, 60-40, 75-25, 20-20 or a 90-10, designating the relation of the printed wool to the white. The print roll sets over a furnish roll, which revolves in the color box and the rope, or rather several ropes, of slubbing run between them and over to a coiling pot-eye which lays the printed material on a burlap sheet on the floor. The color is forced into the slubbing by the weight of the top roll, while the plain portions are left unprinted, since the slubbing still contains much of the emulsion of oil and soap it received before combing and also, because a slight amount of mark-off will do no particular harm.

The object of vigoreux printing is to furnish a melange which will not show long streaks of white or color after it is spun into yarn, as would be the case when two dyed tops were gilled together. The woven cloth has a very smooth, well mixed appearance, not obtainable in any other way. Since this work is only done for the best grades of fabrics, it is also very necessary that the colors have a high degree of fastness to light, fulling, perspiration and general wearing conditions, which limits the dyestuffs which may be used. The most popular dyes are the chrome mordant colors. Not all good chrome colors from a dyer's standpoint are suited for printing. The solubility must be excellent, the color must be fixed perfectly by a steaming with chromium acetate or chromium fluoride and they must have the necessary fastness properties as well. This involves considerable investigation on the part of the user before he can adopt a new untried product in his work.

The thickening used by vigoreux printers also differs from that used by cotton and rayon printers. While British gum is the standby of the cellulose printers, the wool men are inclined toward tragacanth and other of the bassorin gums, combined with flour. Sometimes Irish moss is used, but the difficulty of straining this makes it a troublesome mess, although the results are outstanding. Cloth printers have always noted that the use of tragacanth in the presence of chromium acetate gives rise to a stiffness in the fabric that is difficult to remove, but no such complaints have been registered in vigoreux printing.

The steaming varies in different mills; the average American mill will use the standard type of cottage steamer and work at pressures of from 5-20 lbs. for ½-2 hours, after which the slubbing is back-washed and dried. Some plants run on foreign principles use steamers without pressure, but with air injectors and run a lot for 5-6 hours.

While the chrome colors are most generally used, we do find some work done with the better neutral dyeing milling colors, where the shade cannot be made in any other way. Also the chromiferous acid dyes (Neolans) have been found excellent for vigoreux printing. The milling colors are not fast enough to light, while the chromiferous acid colors stand only a moderate milling, yet there are many varieties of goods which utilize both classes to good advantage.

On account of the demand for a brilliant royal blue with excellent fastness to light, fulling and peroxide bleach, all at a moderate price, experiments were made to print vat dyes on slubbing. The regular process used on cotton or rayon resulted in a very poor fixation of color and a complete tendering of the wool fiber, but further developments resulted in good fixation of color and no tendering whatever. These results were obtained in the laboratory only, because we could never obtain ager conditions in the worsted mill, the least amount of air in the steamer would hinder the reduction of the color and so no fixation resulted. An ager for cloth takes the material over and under rolls till it has completed its course in 5-7 minutes, but there is no contrivance which would carry a rope of slubbing over such a distance without a break-down. As soon as the mechanical difficulties are solved,

we may have vat dyes as vigoreux prints. It may be noted that the most suitable types are those derived from indigo; the anthraquinone vat dyes have but few types that will answer.

WARP PRINTING

The next style of wool printing in general use is warp printing. There is a limited amount done for the tapestry trade proper, but much more for the style of floor covering known as tapestry carpet. Whereas in Wiltons and Brussels we find five or six colors, which are carried in the back until needed in the pattern on the face and in Axminsters innumerable colors, each of which requires a separate dyeing operation, the tapestry carries on each single warp thread a printed stripe for each shade in the pattern and so economizes both in yarn and in dyehouse labor. According to the size and repeat of the pattern, charts are made showing the color sequence on each thread. If the pattern covers 100 warp threads before it repeats, then 100 printings must be made. If the pattern is a small one, the warp thread is wound around a drum of fairly small diameter, say 3-4 ft. but if the pattern is a long one then the drum may be 10-15 ft. in diameter. Only one warp thread is printed on a drum at a time and this is numbered for setting up in the loom in its proper sequence.

The first step in tapestry printing is the souring of the yarn. The yarn is first scoured in the usual manner and rinsed, then worked in a yarn kettle in about 8-9 per cent of its weight of sulfuric acid at 120° F. The wool takes up about 6 per cent of its weight of the acid and holds it firmly against rinsing, then it is extracted and dried and wound on the drum over an oil cloth which covers the wood. The colors used are the general run of ordinary acid dyes which have the necessary solubility and which have proven themselves capable of good fixation after steaming, sufficient to resist the wash which follows to remove the thickener. The shades have previously been matched by the colorist and, in conference with the designer, superintendent, etc., the proper shadings selected. The thickener is generally tragacanth and flour, assisted by some acid; not often sulfuric but frequently oxalic or tartaric. Glycerine is not needed as the printed material is put in the steamer in a wet state and does not dry out.

The printer stands beside the drum and consults his chart. Starting from zero he runs across the bottom of the drum a little color box on wheels on a track, so the furnish roll, which is a quarter to three-eighths inch wide, puts a stripe of color across the yarn which is closely and evenly wound around the drum. Then the chart shows where other stripes of one, two, three or more units width are to be placed. When he has finished color No. 1, he removes the color box and puts in box No. 2 and so on until all the surface has been covered with color. Some mills do not print on plain white soured (acidulated) yarn, but dye the lightest shades in the pattern, using much acid, then overprint the deeper colors on the pale ground shade. The width of the stripes is dependent on the height of the loop or pile in the finished carpet and the whole is nicely calculated so the weaving of the fabric will bring each tuft or loop of color into its proper place in the design. It all seems very complicated, but the trained workers are able to match up the individual threads so that there is seldom a miss, yet it looks like a distorted, elongated pattern to anyone else.

There is now an interesting machine for tapestry printing, which has a number of color boxes on tracks under a warp which is just being made up from the spools. The machine is controlled by a rack of Jacquard cards which cause certain threads to be depressed and contact the furnish roll of each color in turn, according to the design. The pressure seems to be sufficient to penetrate the yarn completely, whereas in drum printing, a boy must rub across the stripes with a flat scraper before the yarn is stripped from the drum for steaming. In the printing machine, the warp travels for 50 feet through a steam atmosphere, then through a washer, a squeeze roll and a drier, then on to a beam, which is sent direct to the loom.

The separate drum prints are piled on trucks, separated by burlap sheets and run into a cottage steamer, where they are steamed at 15-20 lbs. for ½ hour, then washed and dried. As stated before, the ordinary acid dyes are generally used. Some manufacturers have gone so far as to use the faster of the acid colors and the chromiferous acid dyes, but the problem is not one of dyes or technic, it is one of those economic problems brought about by a change in public taste.

The tapestry carpet seemed the last word in efficiency and economy till some enterprising manufacturers developed the idea of machine printing. Not the type of machine just described, but a six roll printing machine with copper rolls over 9 feet long and 3 to 4 feet in diameter, doctor blades a foot wide and color boxes as large as bath tubs. The depth of the engraving had to be enough to carry enough color to saturate a wool pile three-eighths of an inch high and still put some color on the backing. The fabric was made up of soured (acidulated) yarn, like a plain plush with a jute back and in a long continuous run of twelve or more 9x12 ft. rugs. Since the steaming is somewhat sketchy, it is necessary to select dyes that fix well on short steaming. When they do not want to wash the rugs it is possible to use either tragacanth paste or Irish moss (carragheen) which may be dried into the fabric, without stiffening it. The results of this style of printing are sold in the department stores, without any special designation and are accepted by the public in competition with yarn dyed products, although a textile expert could easily note the difference.

SKEIN PRINTING

We next encounter a much smaller industry—yarn printing in skeins. This has a very limited field and is in close competition with ombre, multi-color and tie dyeing. The printing of wool skeins is done over a flat bar which holds several skeins at a time and the color is applied by a block, which is slightly recessed to hold sufficient color to penetrate the mass. The class of dyestuffs used

are mostly the neutral dyeing acid colors and the milling colors of best brightness. The steaming is done in what we term the dog-house type; a simple wooden, or lined, box with a sloping roof, to avoid condensation dropping on the goods. Free steam is run in for an hour or two; no pressure accumulates.

PRINTING PILE FABRICS

Having discussed carpets, we may as well turn to the closely allied pile fabrics, which however, are handled in quite a different manner. Pile fabrics of wool are either worsted or mohair, with a cotton backing, and with either a cut pile or a loop, the first being called plushes and the latter friezes. We might also include another class, having generally a mohair face, which are rough, unsheared, shaggy materials, designed to imitate the skins of animals and generally used for carriage rugs, etc. The cut and uncut piles of both worsted and mohair are printed by either engraved rolls in a machine or by means of screen printing. There are several conditions which call for special equipment in the case of machine printing, involving expense which makes screen printing a much more advantageous proposition. First, the fabrics are much wider than any cotton or rayon goods and will require 60 inch rolls and a correspondingly large machine throughout, including the ager, washer, etc. Then the engraving must be adjusted in depth to exactly produce the degree of penetration desired on the goods in question. The average design will not have either fine lines nor large blotches, but will be a series of small fleur de lis, diamonds or dots, or some conventional border. There may be a call for etched printing, comparable with the damoisette prints on transparent velvet, where the rayon pile is corroded or carbonized with aluminum chloride, only in the case of worsted we use caustic soda. Such styles call for large blotches and color is applied beside the etched pattern. In such cases there will be the precaution of using colors that will not be adversely affected by any caustic that may enter the wash waters.

While cotton velour used to be printed extensively with discharge colors, the general tendency for worsted and mohair pile fabrics is to have darker application or overprints on a moderately dark ground. It may be that the complexity of the dyeing operation for these union fabrics made it difficult to always obtain colors that would prove to be good union dyes and at the same time discharge to good whites. In any case it will make a far better job to overprint with good fast colors, than to have to depend on the discharge colors in common use. Thus a mohair plush made with a sulphur black dyed back, having the pile dyed with a good fast combination of the chromiferous acid colors and overprinted with a deeper shade of the same, will produce a fabric that will retain its color after many years of wear. It is necessary to have the ground color well soured, which it will be if dyed by the regular process for the chromiferous acid colors. The acid will be actually chemically combined with the substance of the worsted or mohair, so the pieces may be washed to remove all traces of acid from the cotton back, without affecting the sulfuric acid content of the wool. The prints may contain some further acid addition, but the use of chromium acetate or fluoride is optional, as it has been found that the results are just as fast without chromium salts. The important point is that the steaming shall be sufficient.

SCREEN PRINTING

Screen printing has become quite popular in all textile lines, so a brief review of the important details will be in place here. The first essential is a firmly supported table a trifle longer than the average cut of the goods to be printed. The top of the table must be perfectly even and solid and covered with a good firm felt, over which is a good quality of smooth oilcloth. The edge of the table has been reinforced with 1½ inch angle iron, which serves as a guide and for fastening the lugs which limit the spacing of the frames and insure perfect registration of multicolored designs. The length of material is held in place by pins along the selvage during the printing. When the piece is finished, it is air-dried, generally by hoisting the whole piece in a horizontal position some six feet above the table, by means of a series of clips and cords which run over pulleys. Later the whole piece is either festooned on a rack or wound on a metal pile fabric carrier, before running it into the steamer.

The screens are wooden frames, well reinforced against warping on account of the moisture to which they are subjected and braced so they will not lose their rectangular shape. They are covered with silk bolting cloth; the screen printer of silk and rayon dress goods may use a fine mesh of bolting cloth, but this would not pass sufficient color to cover and penetrate a pile fabric very well, so the printer of coarser surfaced goods must use proportionally coarser meshed bolting cloth. When the bolting cloth has been stretched as tight as a drum head, the design is sketched on it; some artists work in reverse on the under side of the screen while other prefer to work on the inside or top surface. According to the color distribution of the design, a screen is made for each color, just as a roll is engraved for each color in machine printing. Where the color paste is to register, the screen is left untouched, while all other parts are stopped by an application of a quick drying varnish or lacquer. Many of the screens in use by printers of light dress fabrics prefer a green waterproof lacquer, while the printers of heavier pile fabrics use a transparent varnish, such as Valspar, which is semi-transparent and allows the worker to note whether his registration is perfect. In the same way a screen is made for each color in the pattern and it need hardly be suggested that absolute registration of the different units is essential to perfect work.

The dyestuffs used will depend on the fastness requirements. There is little use in employing for an over-print a dyestuff which is very much faster than the ground color and vice-versa; the whole print job should be of the same general degree of fastness. The dyes are chosen, not only for their shade, but for solubility and ease of fixation.

The thickener for screen prints must take into consideration the fact that the screen has to be washed up each time after using and it will not do to have any paste which dries to a hard crust that cannot be easily washed out with warm water, hence tragacanth is a favorite, with an addition of a more viscous, sticky gum like arabic. Gum arabic is added for another reason; wool and mohair fabrics, unlike cotton, are not singed before printing, so the surface is full of loose fibers. The ordinary tragacanth print paste is inclined to retreat from all the outstanding hairs and collect on the surface of the goods, so that when the print is finished, the face is full of uncolored fibers. The addition of the more sticky gum arabic causes these loose fibers to lie flat, or at least to retain whatever color paste they had applied to them and so a better covered print is the result. While the color paste is applied to the goods in the case of all light dress fabrics, by one operator, who can easily span the table with its 39 or 40 inch goods, the printing of 60 inch goods requires two men operating the screen and another supplying them with color paste. A quart or so of color paste is dumped on the screen and each man works the wooden scraper or squegee as far as he can and then passes it to the other. If the size of the mesh of the screen is right, two passes each way will apply all the color necessary; if more than this is needed, then the mesh of the screen is too fine for that class of goods. After printing, air drying and steaming follow, then rinsing, drying, brushing and finishing.

Mention was made of imitation furs. In such cases the colors are figured down to four or five; the material is dyed to the second lightest shade, not to the lightest, which is generally the shade called Polar Bear on the Standard Color Card. This Polar Bear color is obtained by a discharge tinted with a trace of phosphine, while the darker colors are made by over-printing. The main trick in making artificial fur colors is to use combinations for the browns that do not look "aniliney." There are a few good straight acid browns that are free from the orange or yellow overtones we would get if we made our browns from Acid Orange or Tartrazine. This is an industry that has made many struggles for recognition. In the year 1900 a mill near Philadelphia was making artificial animal skin plushes for women's and children's cloakings by this method and in 1933 another New England manufacturer was making them for carriage rugs. They had perfect imitations of lynx, coyote, raccoon, fitch and even a leopard, all colored by screen printing.

WOOL PRINTING OF THE FUTURE

Now that we have a picture of the things that were, let us take a look forward toward the things that may be.

A large and prominent wool and worsted manufacturer in Passaic, N. J., has been, for several years, making a very attractive necktie of a close crepy worsted fabric, dyed with fast ground color and discharge printed in some cases and overprinted in others. Lately they have added dressing gowns of printed worsted and the reports are that both lines are selling very well. Naturally the only designs one will encounter are the conventional stripe, dot and occasional plaid, but the results show that the thing can be done.

Of course there has been a small but steady business in the delicate printed challies, used for the dresses of little girls, where acid and milling dyes are printed direct on the chlorinated fabric, in very small scattered designs. Then there are blankets of part wool which are printed on both sides on a duplex machine to resemble Navajo Indian productions. Screen printing of emblems, insignia, etc., on blankets, for purposes of identification, is quite common, but is hardly worth our consideration here. We have lately been shown some swatches of wool prints, belonging to the modern jazz and swing era, offered in competition with similar designs and colorings now used on cheap rayon goods. The violets, greens and blues were primitive and spectral, or rather spectrum-like, and the whole was branded with an air of bad taste and cheapness.

All of the cases just cited show certain possibilities along the lines of wool printing. We know today that chlorination of the goods is not a necessity and that many lines of colors may be printed as well on heavily soured material. We can discharge ground colors without tendering the goods, at times by using the basic zinc hydrosulfites with acid and at others by adding protective substances to the regular discharge paste. We have today really wonderful ground colors that are dischargeable, in the series of chromiferous acid dyes. There is a hope that we may discharge print vat dyes on such grounds, because agers are available of sufficient width to handle the wider goods.

The success of worsted printing as a business venture depends entirely on the designer. There will be no place for brilliant floral, arabesque or rococco patterns, everything must be very conservative at first; probably a fine wavy line or a series of dots, or a fine all-over design. Possibly an imitation of a fancy weave would be found attractive, anything to get away from the severity of plain piece dyed goods. The competing lines have found it profitable, so it is almost a challenge to the worsted manufacturers to develop a line of dress prints that will appeal to the better class of trade. When the designer has developed a suitable line, there will be little difficulty in producing the results.

Watch for the Knitting Arts Exhibition Number— Will Appear April 15th, 1940

•TECHNICAL NOTES FROM FOREIGN SOURCES•

A New Non-chlorine Treatment for Making Wool Unshrinkable (Non-Felting)

A. J. Hall—Jour. Soc. Dyers & Col., 55-8, *Aug.*, 1939.—At a meeting of the Manchester Section of the Society of Dyers and Colourists in March, 1937, A. J. Hall described a new method of making wool unshrinkable (non-felting) by treatment with sulfuryl chloride (SO_2Cl_2) dissolved in white spirit, a petroleum distillate. This lecture was discussed in an article published in the AMERICAN DYESTUFF REPORTER (26-9) of May 3, 1937. The original paper was not, however, immediately submitted by the author for publication, and did not appear in the Society's journal until the August issue of 1939. In the considerable interval which had thus elapsed the author had continued his investigation of the subject, and the results of this additional work are incorporated in the article as finally published.

The main features of the new process and its apparent advantages over the well-known chlorination method have been outlined in the issue of this journal just mentioned, though it may be here repeated that the treatment consists essentially in soaking wool in a 2 per cent (by volume) solution of sulfuryl chloride for one hour at 15° C. The expanded article as now published constitutes a detailed study of the effects of sulfuryl chloride on wool as regards the non-shrinking properties produced when it is applied under varying conditions of concentration, time, temperature, etc., and also a consideration of other effects, such as change in tensile strength and extensibility of the fiber, color, softness, etc., which may result from such treatment. The relative changes in strength and extensibility of wool, cotton, silk and rayon yarns on treatment with sulfuryl chloride are given in tabular form, and the interesting conclusion is reached that wool rendered non-felting by this process may gain up to 25 per cent in tensile strength and up to 37 per cent in extensibility.

Detailed comparisons are made between the properties of wool which has been treated with sulfuryl chloride and of wool treated with chlorine. There is some discussion of the rather complex relationship which exists between non-felting wool and dyes, and a review of certain alternative substances, such as thional chloride and chromyl chloride, which have also been tried for rendering wool unshrinkable. Observations are collected into numerous tables, and two graphs are employed, one to show the manner in which the sulfuryl chloride treatment is influenced by the original moisture content of the wool, and one to express the percentage exhaustion of chlorine and of sulfuryl chloride when wool is treated with a solution of either reagent. Mention is also made of the possibility of treating wool with the vapor of sulfuryl chloride, rather than with the solution.

This process for treating wool with surfuryl chloride is now in large-scale plant operation in Great Britain, Canada, Australia, the United States, France and Switzerland. It is protected by patent in the more important countries of the world, and wool so treated carries the registered trade mark "Dri-sol."

Dissociation of Ammonium Salts in Contact with Wool Part 1

H. Briggs and F. L. Goodall—Jour. Soc. Dyers & Col., 55-7, 1939.—This is the first part of a report covering a detailed study of the behavior of several ammonium salts when boiled alone in water, in contact with wool, and under conditions approximating to those of a normal wool dyebath, with special reference to the resultant dissociation of the salts into ammonia and free acid under such conditions. Results obtained from the numerous trials made are shown in 12 different tables throughout the report. This article, which appears to represent an extremely thorough examination of the subject, cannot well be abstracted. It is possible, however, to give in the authors' words the purpose and result of the research which it covers: "The purpose of Part 1 of this paper is to study the effects of boiling ammonium salts under conditions approximating to practical dyeing . . ." "The behavior of five ammonium salts, viz. the chloride, sulfate, formate, oxalate and acetate, in solution at the boil has been examined in relation to their uses in practical dyeing. Comparative tests on 0.033 N solutions of each salt alone at the boil, for 1 hr., show that volatilization of ammonia is not great, but, nevertheless, is appreciable and differs with each salt, increasing in the order named . . . Similar tests made in the presence of wool, purified with special reference to freedom from alkali, showed much the same order of degree of dissociation . . . When such tests are made in the presence of added commercial quantity of dye, there is possibly a slight tendency for increased volatilization of ammonia in all cases, but, in general, it may be said that the presence of dye has little effect on dissociation of ammonium salts, whether or not wool is also present."

Hydrocellulose and Oxycellulose

TIBA, No. 7, July, 1939.—Feeling that the full implications of these widely used terms are frequently not too well understood, it has seemed worth while to the editors to collect and present to their readers, beginning in the present number, the publications of certain outstanding authorities on this complex subject. The present article is based upon one by J. F. Davidson of the British Cotton Research Association, originally printed in the *Journal of the Textile Institute* for June, 1936.

Under the heading "Hydrocellulose" are considered in detail the observed results of treating cellulose with acid, and the more important properties which distinguish the products thus formed. These are (a) an increase in the

reducing power, as determined by use of a standard copper solution; (b) loss of tensile strength of fiber and (c) fluidity of the cellulosic solution in copper-ammonium liquor.

The constant relationship maintained between these factors under changing conditions of acid treatment is made clear, as is also the accompanying change in the molecular structure of the cellulose.

As in the case of hydrocellulose, the series of compounds which result from the action of oxydizing agents on cellulose, known as oxycellulose, exhibit an increase in reducing power and in fluidity as the action is continued. There is also a corresponding decrease in fiber strength, though this is relatively slight, as compared to the result of acid action. The author discusses the rather obscure chemistry of the reaction, the probable changes in molecular structure which take place, and refers to the characteristic property of these compounds of exhibiting affinity for certain basic dyes, such as Methylene Blue.

Further studies are to follow. When completed, the series should constitute a good collection of authoritative opinions on the subject.

Sound and Silk Worms

The British *Discovery* says that silk worm parasites are being fought with sound waves, not exactly sound waves but supersonic vibrations. To explain, a dog can hear a whistle pitched above 20,000 cycles per second which is inaudible to a human ear. "Sounds" above this limit are called supersonic and are air waves like audible sounds.

Silk worms in Japan are subject to a parasite which has destroyed thousands of millions of cocoons annually. There has been no way to get rid of the parasite without losing the worm at the same time.

Now, after years of study it has been found by a Research Station in Japan that the parasite can be easily disposed of without danger to the host. At the right time the cocoons are immersed in water and subjected to supersonic bombardment for three minutes. The waves are not sufficient to kill, but make the parasite let go. Then he suffocates.

The method is being rapidly adopted by the whole silk industry and is already reported to have saved upward of $5,000,000 in a year. (*Discovery*, July, 1938.)

Determination of Traces of Copper in Fabrics

G. Lugaz-Mornet—TIBA, No. 7, July, 1939.—The presence of copper in fabrics destined for rubberizing has frequently to be determined, as it is known that the action of this metal is highly unfavorable to such treatment. It is therefore useful to have available for such determinations a method which is quick and convenient, and at the same time sufficiently accurate to indicate dependably whether or not danger to the rubber is to be apprehended.

For such determinations a volumetric method is recommended if the copper is present in appreciable amounts, while for slight traces of the metal a colorimetric method is better suited.

Detailed instructions are given for the treatment of fabric samples to be examined, including ignition, dissolving and purification of residues, etc. In the first process a final titration of the resultant sample copper solution is made with N/1000 sodium hyposulfite, while in the second the copper content is determined by comparison in a Duboscq colorimeter of carefully prepared standard pure copper solutions with one made from the ignited sample of fabric.

Significance of Temperature in Wool Dyeing. II—A Study of the Acid Combining Capacity of Wool

F. L. Goodall and C. Hobday—Jour. Soc. Dyers and Col., 55-11, *November,* 1939.—In a paper published in 1938 in the same Journal, one of the present authors (Goodall) has drawn attention to certain differences in dyeing behavior between Acid Orange GG, a typical molecularly dispersed and level dyeing acid dye, and Polar Yellow R Conc., a typical aggregated dye. It was shown that, given a period of treatment long enough to insure equilibrium being attained, the final degree of exhaustion of the dye bath and the dyed result were substantially independent of temperature with Acid Orange GG; while with Polar Yellow R Conc. both degree of exhaustion of the dye bath and the dyed result were highly affected by temperature.

Experiments upon which these findings were based had been carried out with commercially scoured yarn and commercial dyes in amounts commonly employed in practical dyeing. The conclusions reached as to the significance of temperature were of such fundamental importance to both the practice and theoretical comprehension of wool dyeing that it was considered advisable that they should be made the subject of more stringent experimental investigation. It was therefore proposed to attain an increased refinement of test by employing purified material, by using amounts of pure dye ranging from those ordinarily used for dyeing light shades to quantities in excess of the probable dye-combining capacity of the fiber and by making experiments on both dyes under comparable pH conditions.

This proposed extended examination offered the opportunity of studying the fiber's capacity for combination with both dye and colorless acid under varying temperature conditions. This is an important point, because of the assumption generally found in the literature of the subject of acid-combining capacity that a particular value determined for this property of wool, usually at room temperature, holds good for all temperatures at which wool might reasonably be treated with aqueous solutions, though the work of Speakman and Smith in 1936 drew attention to the general effect of increased temperature of aqueous treatment of wool resulting in increased accessibility of fiber to dye and other particles in consequence of increased fiber swelling.

(Continued on page 168)

PROCEEDINGS OF THE

American Association of Textile Chemists and Colorists

APRIL 1, 1940

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W. L. Carter, Chairman; Seymour Schandler, Secretary

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Bernard Menin, Chairman; Ruth Chartener, Secretary

Members should notify the **Secretary** immediately of all address changes

• CALENDAR • OF COMING EVENTS

Meetings, Council and Research Committee, National Bureau of Standards, Washington, D. C., April 19, 1940.

Meeting, Philadelphia Section, Penn A. C., 18th and Locust Sts., Philadelphia, Pa., April 26, 1940.

Meeting, New York Section, Swiss Chalet, Rochelle Park, N. J., April 26, 1940.

Spring Meeting, Piedmont Section, King Cotton Hotel, Greensboro, N. C., April 27, 1940.

Annual Meeting and Convention, auspices New York Section, October 18th and 19th, 1940, Hotel Commodore, New York City.

ONE HUNDRED AND NINETEENTH MEETING OF THE RESEARCH COMMITTEE

THE 119th meeting of the Research Committee followed the Council meeting in Boston on Friday afternoon, January 26, 1940. Present were Chairman Louis A. Olney presiding, K. H. Barnard, W. H. Cady, H. Christison, P. N. Collier, R. E. Derby, C. Z. Draves, W. C. Durfee, H. F. Herrmann, A. E. Hirst, W. R. Moorhouse, G. A. Moran, C. L. Nutting, F. A. Prisley, B. A. Ryberg, E. R. Schwarz, W. M. Scott, C. A. Seibert, H. W. Stiegler, H. S. Travis, B. Verity, P. J. Wood, and H. C. Chapin, Secretary.

Mr. Cady, Chairman, reported for the Committee on Gas Fading of Acetate Rayon. There was extensive discussion of fading standards by Mr. Herrmann, Mr. Ryberg and Mr. Seibert, in which Mr. Seibert showed a number of tentative standards prepared by him, described apparatus for conducting tests, and outlined views of manufacturers whom he had interviewed.

Mr. Ryberg reported the results of a questionnaire on Perspiration Tests, which seemed to favor testing in an oven, as quicker than a desiccator, and about as accurate. There seemed to be possibility of reducing the pH of the alkaline test without much difference in results, thus approaching the British test. There still seemed demand for a series of graded standards rather than the present single standard. Mr. Ryberg reported also the results of a questionnaire on wash fastness tests for rayon, which indicated break-down of fabric and seam slippage before appreciable fading. He reported that work on analysis of fiber mixtures is continuing in collaboration with the committee of the American Society for Testing Materials.

Mr. Barnard reported that blue-prints had been prepared for the Drape Meter, so that a number of machines could be made and tried by members of the committee. Professor Schwarz discussed the development of the machine, and correlation of results with those from machines of other types. Under development is an attachment for measuring the force necessary to flex the fabric. Professor Schwarz discussed also the factors involved in measuring the water shedding properties of fabrics, and the need of better nomenclature.

It was stated that the Cotton Wash Fastness Tests, agreed upon by this Association and the National Association of Finishers of Textile Fabrics, had been submitted to the Division of Trade Standards of the National Bureau of Standards, for its approval and adoption. The Chairman of the Research Committee was authorized to present to the American Standards Association, for its adoption, the standards of our Association for wash fastness of wool, cotton and silk, and the standards for crocking and rubbing.

There was discussion of how to make artificial light fading tests more consistent, in the course of which Dr. Stiegler reported experiments showing rapid drop in transmissivity of glass globes to ultraviolet light. There was also discussion of production of cards illustrating standards of crocking, of the desirability of including a list of pigments in the Year Book, and of the regulation of temperature in hot pressing tests.

Respectfully submitted,

HAROLD C. CHAPIN, *Secretary.*

A 1940 REVIEW OF THE INTER-SOCIETY COLOR COUNCIL

THE Inter-Society Color Council is now in its tenth year. At the present time, the Council represents the greatest concentration of color interests ever brought together in this country. The present roster includes sixty individual members and the following national societies and associations:

American Association of Textile Chemists and Colorists
American Ceramic Society
American Psychological Association
American Society for Testing Materials
Illuminating Engineering Society
National Formulary, American Pharmaceutical Association
Optical Society of America
Society of Motion Picture Engineers
Technical Association of the Pulp and Paper Industry
Textile Color Card Association of the United States
U. S. Pharmacopoeial Convention

The Council has been active in publishing several hundred pages of technical and informative matter, in addition to the regular reports of meetings and other business. These publications have been furnished to all the delegates from the member bodies. The I. S. C. C. News Letter has continued and expanded its function of informing the membership of the work of the Council. To this has been added information concerning color from a variety of sources. Plans have been made to increase the number of News Letters to six, for the coming year.

Recently one of the major problems undertaken by the Council was concluded. This involved the development of a simplified method of designating colors. A primary concern of the Council during the coming year, will be the exploration of further applications of this method that has been recommended for the description of drugs and chemicals. The Council hopes to encourage the use of this method wherever it is appropriate, and discourage attempts to inappropriately employ it. The question of the adaptability of this method of designating colors to other fields, will require the advice of every member-body. It is planned to appoint a committee charged with the duty of carrying on the necessary investigation.

A survey is being made, of color terms that have been adopted as standard by the different member-bodies. These include the fields of textiles, ceramics, paint, lighting, psychology, pharmaceuticals, and paper. In its present form, the color-term survey is incomplete, but may indicate

the need for establishing a more uniform terminology in the field of color.

The technical papers presented at the 1938 and 1939 meetings have been published, and afford a permanent record of accomplishment. There are several results other than those that appear in literary form, such as the I. C. I. charts which were sponsored by the Council during the past year. In addition, two bibliofilms have been made available. These are, a "Color Bibliography" and a "Munsell Color Diary."

Contact has been maintained with the local color groups at Washington, Boston and Chicago, while the individual members of the Council have, during the past year, established a New York group.

It is planned, during the coming year, to continue along the lines which have already been established, in the matter of cooperative participation in color problems of general significance.

The dissemination of information about instruments for the measurement of color, colored materials, and light sources, is to be continued.

A joint session is planned with the Illuminating Engineering Society at its meeting next September, in Spring Lake, N. J. Joint sessions with other member-bodies will be planned.

Perhaps of even more value than the joint sessions themselves, is the permanent record of the technical papers that are presented. These papers are published in the journal of the sponsor body.

From a review of the interests of the different societies and associations that compose this Council, it is believed that of first importance is the matter of detecting small color differences. Various aspects of this problem have been discussed. Tests for suitable observers, specifications for suitable light sources, methods of describing the amount and character of the differences, instrumental substitutes for visual inspection, development of recognized tolerances for specific uses of specific materials, are all possible subjects for Council action during the coming year.

REPORT OF THE A.A.T.C.C. DELEGATES TO THE INTER-SOCIETY COLOR COUNCIL

THE American Association of Textile Chemists and Colorists has continued its interests in color through the activities of its Committee on Color, all of whose members are delegates to the Inter-Society Color Council.

References to the activities of the Color Council have been published from time to time during the year 1939 in the Proceedings of the A.A.T.C.C. The 1939 Year Book of the A.A.T.C.C. contains on pages 118 and 119 a bibliography of the more important books on color published from 1891 up to date. It also continues on pages 120 to 122 the practice inaugurated in the 1930 Year Book of including a bibliography of articles published during the previous year on the subject of color with special reference to textiles and dyes. This bibliography is classified into sections dealing with (1) instruments, (2) pure science, and (3) applied science.

The A.A.T.C.C. delegates are continuing to recommend that this organization maintain active participation as a member-body in the Inter-Society Color Council.

Respectfully submitted,

WALTER M. SCOTT, *Chairman*
CARL Z. DRAVES
WILLIAM D. APPEL
ROBERT E. ROSE
WILLIAM R. MOORHOUSE
KENNETH H. BARNARD
HENRY F. HERRMANN
GEORGE A. MORAN
ALBERT H. GRIMSHAW
MARY ANNA GRIMES

MEETINGS, NEW YORK SECTION

Third Meeting

THE third meeting of the New York Section was held on January 26th, 1940 at the Swiss Chalet, Rochelle Park, N. J. The speaker was Dr. F. Bonnet, Jr., Director of Textile Research and Standards Laboratory, American Viscose Co., Marcus Hook, Pa., whose subject was "Vinyon—A New Textile Fiber." This paper was considered very interesting and numerous questions were asked by the members in attendance.

Our Chairman, Louis Zisman, referred to the recent deaths of Dr. Joseph F. X. Harold and Percey F. Kingsbury. In respect to their memories, the members stood in silence for fifteen seconds. A motion was proposed and seconded that the Secretary write a letter of condolence to each of the bereaved families.

George Baxter, Henry Herrmann and Dr. H. W. Stiegler, nominated for Councilors, were elected unanimously by a motion proposed, seconded and carried that the Secretary cast one ballot.

P. J. Kennedy, General Chairman, 1940 Convention Committee, reported that practically all of the chairman of the various committees had been selected.

Total attendance was 130.

Respectfully submitted,

P. J. KENNEDY, *Secretary.*

Fourth Meeting

THE fourth meeting of the New York Section was held on March 1st, 1940 at the Swiss Chalet, Rochelle Park, N. J. The speaker was William H. Cady, Chief Chemist, U. S. Finishing Co., Norwich, Conn., whose subject was "Textile Fibers—Old and New." It was the consensus of those present at this meeting that this paper was most enlightening and ably presented by Mr. Cady.

Our Chairman, Louis Zisman, stated that plans were now under consideration for our annual sectional outing which is usually held during the month of June.

Dr. J. E. Meili, Vice-chairman, informed the members regarding the technical papers for our next meeting in New York City at the Chemists' Club.

Henry Herrmann, Vice-chairman for our annual convention, elaborated on the special features now under consideration by both the local and national committees. P. J. Kennedy, General Convention Chairman, stated that all committee chairmen have been selected and the definite plans for a successful convention are now under way.

Total attendance was 95.

Respectfully submitted,

P. J. KENNEDY, *Secretary.*

MEMBERSHIP APPLICATIONS

Senior

Louis E. Anderson, Jr. — Textile Chemist, Hercules Powder Co., Wilmington, Del. Sponsors: B. H. Little, F. Rapp.

Bessie L. Appel — Roxbury, Mass. Sponsors: E. E. Fickett, H. C. Chapin.

George S. Aldrich—Overseer of Dyeing and Wet Finishing, Glenark Mill, Woonsocket, R. I. Sponsors: A. J. Midwood, W. H. Zillessen.

Malcolm M. Anderson—Dyer, S & M Dyeworks, Inc., Philadelphia, Pa. Sponsors: B. C. Bond, J. R. Senior.

Frank A. Beevers—Overseer of Dyeing and Bleaching, Shepherd Worsted Mills, Newton, Mass. Sponsors: H. J. Sheehan, H. A. Ross.

Charles E. Bergamini—Textile Chemist, Hercules Powder Co., Wilmington, Del. Sponsors: A. G. Fisher, Jr., B. H. Little.

J. Kenneth Berry—Chemistry and Dyeing Instructor, Rhode Island School of Design, Providence, R. I. Sponsors: T. A. McCann, S. L. Wheaton.

Aubrey O. Bradley—Supt. of Azo Colors Area, E. I. du Pont de Nemours & Co., Inc., Dye Works, Penns Grove, N. J. Sponsors: W. C. Brothers, E. F. Hitch.

Earl B. Brearley—Chemist and Supt. of Dyeing, Jantzen Knitting Mills, Portland, Ore. Sponsors: A. T. M. Marshall, D. A. Anderson.

Henry D. Caldrice—Boss Finisher, Georges River Woolen Mills, Warren, Maine. Sponsors: C. H. A. Schmitt, H. A. Ross.

Perry T. Delmarle—Salesman, Socony-Vacuum Oil Co., Philadelphia, Pa. Sponsors: W. F. Fancourt, 3rd, W. F. Fancourt, Jr.

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Werner Floersheim—Superintendent, Stonewall Cotton Mills, Stonewall, Miss. Sponsors: W. F. Crayton, A. W. Picken.

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Donovan E. Kualnes—Research Chemist, E. I. du Pont de Nemours & Co., Inc., Deepwater, N. J. Sponsors: S. S. Rossander, A. J. Wuertz.

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Frederick E. Hilger—Salesman, General Dyestuff Corp., Philadelphia, Pa.

Francis Betts Hillhouse—Salesman, National Aniline & Chemical Co., Boston, Mass.

Harry N. Kopple—District Sales Manager, Quaker Chemical Products Corp., Conshohocken, Pa. Sponsors: E. S. Dunlap, W. F. Fry.

Tim Jean LaFontaine—Production Manager, W. B. Farrell Associates, Wayne, Mich.

Arthur L. Munson—Sales Engineer, National Carbon Co., Chicago, Ill. Sponsors: H. Boxser, D. Anderson.

Fred G. Portz—Chemical Mfr. and Jobber, F. P. L. Chemical Co., Milwaukee, Wis.

Dorothea L. Scheer—Director of Textile Laboratory, R. H. Stearns Co., Boston, Mass.

Harold B. Whiting—Research and Development, A. C. Lawrence Leather Co., Peabody, Mass.

Student

James F. Cairns—New Bedford Textile School. Sponsor: F. E. Busby.

George M. Dabrowski—New Bedford Textile School. Sponsor: F. E. Busby.

John C. Gilman, Jr.—New Bedford Textile School. Sponsor: F. E. Busby.

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John J. Fitzgerald—Bradford Durfee Textile School. Sponsor: L. B. Coombs.

Normand Adrien Hamel—Bradford Durfee Textile School. Sponsor: L. B. Coombs.

Edward Hungerford—Philadelphia Textile School. Sponsor: E. C. Bertolet.

J. Turner Jones—Georgia School of Technology. Sponsor: C. A. Jones.

William S. Pearson—North Carolina State College. Sponsor: A. H. Grimshaw.

Donald J. Shaw—North Carolina State College: Sponsor: A. H. Grimshaw.

Jack Soroka—North Carolina State College. Sponsor: A. H. Grimshaw.

Sidney Tager—North Carolina State College. Sponsor: A. H. Grimshaw.

Application for transfer to Senior: Clyde J. Horne.

UNEMPLOYMENT REGISTER

Members of this association, who are without employment, should forward to the secretary a statement as to their qualifications and experience. This information will subsequently appear on these pages with an identifying key number. Employers are also requested to file with the American Dyestuff Reporter any vacancies which may occur in their business.—H. C. Chapin, Secretary, Lowell Textile Institute, Lowell, Mass.

Key: A—Laboratory and research; B—Dyeing or printing; C—Finishing; D—Sales; E—Instruction; F—Executive.

NOTE: PERSONS WHO HAVE OBTAINED EMPLOYMENT SHOULD NOTIFY THE SECRETARY OR THE AMERICAN DYESTUFF REPORTER AT ONCE.

A-B-7

Education—Evening school in textile dyeing and chemistry.

Experience—Dyehouse laboratory for 2 years. Foreman dyer and finisher on hosiery for 9 years. Experience on ribbons also vat dyes on rayon and silk skeins. 2 years assistant to superintendent. Desires position either in demonstrating and sales or dyer; New York Viciniy. Age 33; married.

A-B-8

Education—Graduate Chemist.

Experience—Print superintendent, colorist; eleven years' experience in all types of fabrics, specializing on rayon; 8 years' dyestuff laboratory and demonstrating. Excellent references; age 37; married.

A-B-9

Education—Bradford Durfee Textile School, 1918, chemistry and dyeing course.

Experience—Dye application, textile and color chemist; good general factory, laboratory and office experience; accustomed to assuming responsibility; handled all types of help; purchased chemicals, dyes, etc.; executive ability; good personality.

Age 42; American, married; will go anywhere for interesting work; references.

A-B-10

Education—1 year of textile chemistry, day course, Philadelphia Textile School; also business course.

Experience—3 years as apprentice in weaving mill in Germany, office and stock room, general clerical work, practice in all departments of cotton manufacture, dyeing, bleaching and finishing of cotton-rayon mixtures, piece and package processing; several mos. in laboratory of German dyestuff manufacturer, dyestuffs and assistants and their application, vat and naphthol dyeing.

Age 20; will go anywhere in U. S.

A-B-11

Education: Graduate chemist. Correspond and converse German, some French.

Experience: 3 years dyer; 4 years dyestuff testing, trouble-shooting, purchasing; 4 years demonstrating, consulting, and supervising for large dyestuff manufacturer. Thoroughly experienced on rayon, cotton, silk, acetates, printing, vats. Fullest references as to character and ability. Seeks position as technician, consultant, or superintendent with reliable dyestuff sales organization or dyehouse. Age 33, married.

A-B-12

Education—Philadelphia Textile School (Evening), Chemistry and Dyeing, Quantitative and Qualitative Analysis.

Experience—Two years in yarn office, making wool stock blends.

Last 6 years in dyehouse, 4 years as kettle hand, 2 years in piece dye work. Worked on yarn, raw stock and piece goods; has been dyer on union piece goods, cotton, rayon and wool, leaving wool white; also worked on all wool fabrics and wo[illegible]en cross dyes; also considerable laboratory experience doing laboratory dyeings and extraction work. Seeks position as dyer or laboratory technician.

Age 30; married; references.

A-B-13

Education—B.S., Chemical Engineering, Oregon State College, 1926.

Experience—First experience in dry cleaning plant; few months as sampling and control chemist with potash and chemical company; two years in dry cleaning plant, all phases of work; few months on routine and special analyses, plant problems, special studies and research for gas and electric company; 10 years teaching experience on textile chemistry, dyeing and textile testing covering all general and special courses in this field; consultant work with various mills. Seeks position in textile chemistry or dyeing.

Age 37; married; will go anywhere; references.

A-B-C-4

Education—Educated abroad.

Experience—Twenty years experience in the textile field as bleacher, dyer, finisher and chemist. 16 years in charge of dyestuff laboratory of large dyeing plant, 4 years as chief chemist with large bleachery. Has tested dyestuffs, and chemicals used in the textile field and has manufactured soaps and textile specialties. Has handled all textile fibers; bleaching, printing, dyeing and finishing same. Has done pigment and lacquer printing, waterproofing and fireproofing. Reason for leaving last position was due to business conditions.

Age 41; married.

A-B-C-8

Education—B.T.C., 1933, Lowell Textile Institute.

Experience—5 months as rayon slasher tender; 8 months color matching, dye testing and analytical work; 5 years with large print works in rayon finishing department, laboratory, color matching, dye testing, assistant rayon dyer. Seeks position as rayon dyer, assistant dyer, or any job in a rayon dyeing and finishing plant. Age 29; single.

A-B-C-9

Education—Lowell Textile Institute; chemistry, dyeing and textile finishing.

Experience—Twelve years head dyer in hosiery mills. Dyeing all types of fibers and in combination. Knowledge of all dye applications. Matching and formula making. Charge of every department in a hosiery mill except fixing machinery. Has done jigg work on cottons and rayons. Desires position in hosiery, or in any field. Would like to work as an assistant to head dyer in a woolen or rayon mill. Age 42; married. Will go anywhere in the United States.

A-B-C-D-1

Education—Lowell Textile Institute, Bachelor of Textile Chemistry; Lowell Textile Institute (Evenings), 2 years D. C. Electricity; 2 years A. C. Electricity.

Experience—Six years as chemist and assistant dyer with a large organization. Specialized in dyeing, finishing, bleaching and drying of woolens, worsteds, cottons, rayons and unions in the piece. Some sales experience. Desires position as chemist, dyer, finisher, bleacher or sales. Age 30; American citizen; Married.

A-B-C-E-1

Education—3 years Chemical Engineer major in college; honor graduate Philadelphia Textile School, chemistry and dyeing course.

Experience—Ten years experience as chemist, colorist, technical director in bleaching, dyeing and finishing of cottons and rayons. Also one year's similar experience in South America. Instructor of textiles and textile chemistry in state vocational school, 2 years. Married; age 32; references; will go anywhere.

A-B-C-F-1

Education—Textile Institute course in Dyeing and Chemistry; Extension work at Brown University; Executive Training with Alexander Hamilton Institute of New York, N. Y.; working knowledge of one foreign language.

Experience—Dyeing executive on all types of textiles including stock, yarns in the skein, warp and package, and piece goods. Thorough knowledge of all classes of dyes and dyestuffs and their successful practical application in the plant. Extensive knowledge of all types and makes of equipment for dyeing, bleaching, mercerizing and finishing. Laboratory practice in testing, standardizing, purchasing, costing, planning and checking processes, and market analysis. Good manager of personnel for better efficiency in retaining friendly labor relations. Conversant with modern methods for quality production economically secured through better coordination and correct alignment in processing, on cotton, viscose and acetate rayon, silk, wool, worsted, and mixtures. In excellent mental and physical health; excellent references.

A-B-D-1

Education—Special courses in general chemistry.

Experience—Twenty-nine years' experience in application and standardization laboratories of various dyestuff manufacturers. Well versed in the application of dyestuffs to different textile fibers, i.e., wool, cotton, rayon, silk, acetate rayon and unions, using direct, acid, diazo, sulfur, acetate rayon, chrome and after-treated direct dyestuffs. Six months' actual dye house experience on jigs, open boxes, padders, bleaching and mercerizing. Experience demonstrating sulfur and direct colors at various mills. Seeks position as textile colorist in application laboratory and demonstrator.

Age 46; single; references.

A-D-1

Education—Graduate of New Bedford Textile School, 1936.

Experience—Chemist for woolen mill 7 months; technician and salesman for chemical company 1 year and 9 months. Seeks position as salesman or in purchasing department.

Will go anywhere; married; references.

B-5

Education—High School and Textile School Graduate.

Experience—Twelve years overseer of dyeing on directs, vats, naphthols, sulfur, basic and developed colors. Also experienced bleacher. Age 40; married; references.

B-6

Education—Graduate New Bedford Textile School; also post graduate work in advanced microscopy and rayon testing.

Experience—Five weeks in color shop of print works. Wants position in anything associated with textile chemistry, dyeing, finishing and testing.

Single; age 21; references.

B-C-3

Education—Graduate, Philadelphia Textile School; speaks German fluently.

Experience—Employed at velvet company for 7½ years. Past 2 years working in finishing department on regular, waterproof and crush-resistant finishes (resin finishes). Can take charge of finishing of velvets. Have some piece dyeing experience.

29 years of age; married; will go anywhere.

B-D-1

Education—General education in England. Chemistry and Dyeing Courses at Huddersfield Technical School.

Experience—Has been a superintendent of dyeing since 1911. Has had experience in worsted mills, hosiery mills and woolen mills. Congenial, sober and reliable. Married; references; age 53.

F-1

Education—Two years high school; 6 years evening engineering school; 1 year evening textile school; 1 year industrial management; course in accounting.

Experience—Ten years in an executive capacity in full fashioned hosiery manufacturing business. Familiar with entire manufacturing procedure, finishing dept., dyehouse and office. Specialized in finishing dept. and has good eye for color, finish and quality. Had responsibility of all orders going through mill, stock, grey goods and traffic. Five months in New York sales office. Gets along well with people and contact with employees and customers has always been satisfactory. Previous to hosiery experience was in a mechanical business for 17 years.

43 years of age; single, in good health; will go anywhere.

LAPEL BUTTONS

These buttons, bearing the seal of the Association, can be purchased by members in good standing from the Secretary at $1.50 each.

Twentieth
ANNUAL MEETING AND CONVENTION
HOTEL COMMODORE
NEW YORK CITY
OCTOBER 18TH AND 19TH, 1940

General Chairman

PATRICK J. KENNEDY

EXHIBIT COMMITTEE

Chester A. Amick	Werner von Bergen
Harry Price	Russell J. DeWitt
Robert C. Allison	Paul M. Otto
Clark Heydon	

Auspices of

NEW YORK SECTION

Nation-Wide News Service.

THOMAS F. O'BRIEN
Chairman, Exhibit Committee

THOMAS F. O'BRIEN, Vice-President and General Manager of the R. W. Bates Piece Dye Works, Garnerville, N. Y., will be chairman of the exhibit committee at the twentieth annual meeting. Mr. O'Brien has had many years of diversified experience in the textile industry and is thoroughly familiar with all phases of textile merchandising in the New York market. He was formerly an executive with H. R. Mallinson & Co. in charge of fabric construction and dyeing and was also for many years a technical instructor. This able committee, the members of which are listed at the left, should offer an exhibit of many materials of unusual interest to our members.

AMERICAN
DYESTUFF
REPORTER

Volume 29 April 1, 1940 No. 7

NEW CAPITAL AND UNEMPLOYMENT

A RECENT plea by the president of the New York Curb Exchange called for a thorough review by Congress of the Securities Act of 1933 and the Securities Exchange Act of 1934. He pointed out that from 1923 to 1932 there was an average of $3,300,000,000 of securities issued for new capital each year but since 1932 there has been a yearly average of less than $700,000,000. Statistics have shown that periods of prosperity and depression in business have closely followed the rise and fall in the sales of new capital issues. The president of the exchange brought out the fact that under the present system it was such a complicated procedure to issue new capital stock for public sale and further that it was so expensive and slow that many firms have had to depend on private sale or forego new financing.

Speaking before the fourth annual Tennessee Industrial Personnel Conference in Memphis, Tenn., on March 21st, Edgar M. Queeny, president of Monsanto Chemical Company and vice-president of the National Association of Manufacturers, brought out the same fact and set forth that restoration of steady economic progress by lifting legislative barriers was the only permanent way out of the unemployment problem. He enumerated the following obstacles that have diminished the flow of capital into industry:

1. Federal government registration of security issues and security exchanges set up such stringent conditions of obtaining capital by the public sale of stocks and bonds as to discourage seeking it.

2. Provisions of the securities and exchange act requiring that salaries and the purchase and sale of a corporation's securities by its officers and directors be made public, coupled with a lack of incentive on account of excessive taxes, caused owners of sound small businesses to refuse to seek public capital for expansion.

3. Increased taxes levied on industry by national, state and local taxing authorities during the period of depression have cut down public returns on new investment.

4. Excessive personal taxation has tended to direct investment away from industry into tax exempt fields, especially government securities.

Mr. Queeny concluded his remarks as follows:

"I hope that soon we will have an administration that will understand and give more than lip-service to the system of private enterprise—an administration that will not regard this nation as a completed one with no frontiers left to conquer—an administration that is not convinced that all the wealth that can be created has been created and that all that is left to do is for government to distribute it equitably. This philosophy accepts the inevitability of present unemployment. This philosophy dooms permanently eight and one-half million of our population who want to work, and who can work, to idleness and a bare existence on relief.

"An administration that believes in private enterprise will understand why it is not working now. It will remedy conditions created by recent legislation that you and I know must be corrected if it is going to work. I have laid stress on only two—legislation affecting the issuance of securities and tax legislation—both little understood by the masses, but both of which must be modified in any scheme that will restore the United States to its former steady economic progress."

The fundamental purpose of the security and exchange laws was to give the investor adequate information, and to prohibit manipulation and fraud. We are all pretty well agreed that this is desirable and acceptable. But when it comes to a point where these same laws discourage the flow of new capital into business, tending to decrease employment, it would seem to call for a fresh examination of these laws and regulations with a view to remedying this situation.

KNITTING ARTS EXHIBITION

THE thirty-sixth annual Knitting Arts Exhibition will be held at the Commercial Museum in Philadelphia, Pa., on April 15th, 16th, 17th and 18th. The show will not be open on Friday this year, contrary to custom in past years. As usual the exhibition will be held under the joint auspices of the National Association of Hosiery Manufacturers and the Underwear Institute.

Displayed at this annual event will be knitting machinery, dyeing machinery, drying machinery, winding and throwing machinery, yarns, chemicals, oils and soaps and mill supplies and allied products. There are many exhibits of value to those readers of the REPORTER who are engaged in the wet processing branch of the textile industry and to adequately bring them to your attention the April 15th issue will contain descriptions of those exhibits in which you will have a particular interest. Past exhibitions have shown that this has proved to be an ideal meeting place for buyer and seller alike. Under one roof is concentrated the best creative thought of the industry—the new trade stimulating ideas and designs, the latest developments in equipment and methods.

In addition to the description of displays mentioned above, the April 15th issue will also contain a number of special articles written especially for this issue which will be of particular interest to those of our readers engaged in the knit goods industry.

Tickets for this exhibition will be gladly mailed to those who request them and you are cordially invited to visit us at our booth in the Commercial Museum.

Technical Notes—

(Continued from page 158)

The work of other investigators on the subject of dye and acid absorption by wool is reviewed, and it is pointed out that these have generally failed to take into account the possible loss of fiber substance to the dye bath during treatment, especially at high temperatures. In the view of the authors, for evaluation of the true acid combining capacity it is vital to know the actual weight of wool substance finally present when equilibrium is reached, because it is not the initial weight of wool, some of which may have passed into solution, but the final weight of wool substance which has absorbed the acid or dye or both at the end of the experiment.

Determination of the final weight of wool offers considerable experimental difficulty. A test was made in which 1 gr. of pure wool was boiled three hours in 100 ml. of 0.1 N sulfuric acid, the sample showing after drying a loss of 0.0061 gr. Two other similar samples, treated with the same acid and the addition, respectively, of 1 gr. Acid Orange GG and 1 gr. Polar Yellow R Conc. showed increased weights from the dye taken up. If, however, the loss of weight of the first sample was deducted on the assumption that similar loss had also occurred in the others and the dye-combining capacity for each dye calculated, the values found were much higher than those found by other investigators. Values determined by colorimetric measurements made on the dye baths were still greater.

The accuracy of simple gravimetric determinations being open to question, and considering also other unfavorable factors, such as the possible decomposition of dye in the dye bath, it was felt that for reliable determination it would be necessary to have a method of separating fiber and dye after treatment in such a manner that one or both could be directly determined again. With the exception of the gravimetric method of determining the chlorine ion content of the final bath, methods generally employed for determination of the different variables in wool dyeing systems are unreliable in the sense that they cannot be employed with confidence for the examination of every wool dyeing system which has reached equilibrium, because they fail whenever the conditions under which equilibrium is attained are such as to cause degradation of fiber or dye. A method by which it would be possible to separate wool and dye in the treated pattern appeared to exist in the use of aqueous pyridine.

A series of trials was undertaken to establish the reliability of the pyridine method, using dyed samples of known total weight and HCl content, while at the same time the investigation of the comparative behavior of Acid Orange GG and Polar Yellow R was being carried on.

Preliminary experiments showed that almost complete stripping of Acid Orange GG from the fiber could be effected by two 24-hour treatments with 10 per cent aqueous pyridine, the slight amount of remaining color being determined by comparison with patterns of known dye content. With the faster Polar Yellow R it was necessary to treat the sample for a short time at the boil with 25 per cent pyridine to obtain satisfactory results. Tabulated results of such trials show substantially complete recovery of dye, and only slight fiber loss when the more severe stripping process was employed in case of Polar Yellow R.

A comprehensive series of experiments is then described, in which purified wool samples are treated with HCl and the two dyes, the latter in varying amounts, at varying temperatures and for different periods of time. A third dye, Orange II, which can only behave monobasically, was also examined in connection with certain questions which arose in reference to dye combining capacity. Observations are presented in a series of tables, eleven in all, some of them very extensive.

The more important results of this experimental work and the conclusions drawn from them may be generally outlined as follows:

By dyeings made in 0.01N-HCl with Acid Orange GG and Polar Yellow R, using amounts varying from light commercial dyeings to those greater than the fiber's capacity for sorption, and carried out at 20° C., 60° C. and 100° C., it was shown that—

(a) The weight of HCl sorbed by a treated pattern could be most reliably determined by a special modification of the normal silver chloride precipitation method applied to the final dyebath.

(b) The weight of dye sorbed by a pattern could be most reliably determined by treating the final dyed wool with aqueous pyridine under specified conditions, the pyridine extract being then examined colorimetrically. Any small amount of dye remaining on the pattern could be estimated visually against wool of known dye content. Dye contents measured in this way must be minimum values.

(c) The final weight of wool can be reliably estimated by direct weighing of the dyed pattern and subtracting from this observed weight the values obtained under (a) and (b) above. The final weight of wool so calculated must be a maximum value.

(d) The methods of determination under (a), (b) and (c) are completely general, since they are independent of fiber or dye decomposition during experiment.

(e) Acid Orange GG at all concentrations behaves in a manner similar to hydrochloric acid in giving sorption values which are nearly independent of temperature, but which show a slight increase with rise of temperature.

(f) Polar Yellow R, owing to its large particle size at low temperature, is hardly sorbed at all at 20° C. and only to a very limited extent at 60° C, but at 100° C. wool shows a capacity for combination with this dye of the order of 110 ml. N-dye-acid per 100 gr. wool.

(g) The capacity of wool for combination with hydrochloric acid shows a maximum value of 100° C. and pH 1 of the order of 90 ml. N-HCl per 100 gr. wool. The difference between this value and the corresponding maximum of 79 ml. N-HCl at 20° C. is doubtless due to addi-

tional combination with main chain imino-groups occurring at the higher temperature.

(h) The capacity of wool for combination with Acid Orange GG shows a maxmium value of the order of 100 ml. N-dye-acid at 100° C. and pH 1.25 as compared with 79 ml. N-dye-acid at 20° C.

(i) The capacity of wool for combination with Orange II shows values varying between 160 and 199 ml. N-dye-acid as compared with a total acid combining capacity of 80 ml. N-acid per 100 gr. dry wool at 20° C.

(j) The capacity of wool for combination with Polar Yellow R shows a maximum value of the order of 140 ml. N-dyed-acid per 100 gr. wool at 100° C. and pH 1.4.

(h) A study of the loss in fiber weight shown by the wool itself in the above experiments has confirmed that dyes have a specific action in promoting fiber damage when applied in large amounts, and it is suggested that this behavior is associated with the tendency of the dye to aggregate in solution.

There is no justification for the assumption that the acid combining capacity of wool is independent of temperature, or for the further view that the capacity of wool for combination with both colorless and dye-acids is always the same. Confirmation of the latter view has been obtained at 20° C, but it has been established that wool shows an increased capacity for combination with both acid and acid dyes at high temperatures, and that the extent of the increase varies between acid and dye and between one dye and another according to the effective basicity and state of dispersion in solution of the dye concerned.

This communication is from the Technical Service Department of Geigy Colour Company, Ltd.

The Hydrolysis of Certain Arylamides Used as Dye Intermediates

Hopper, MacGregor & Wilson—Jour. Soc. Dyers & Col., 55-9, *Sept.*, 1939.—In a communication from the laboratories of the Royal Technical College, Glasgow, is described an investigation carried out to confirm or establish the constitution of certain members, eleven in all, of the Naphtol AS series, such as Naphtol AS-ITR, Naphtol AS-OL, etc.

The method generally employed was to hydrolize the Naphtol, by treatment with suitable agents, into the parent acid and arylamine, which were then identified. The constitution thus determined was in each case confirmed by direct synthesis of the Naphtol.

The Hydrolyzing agents employed were alcoholic potassium hydroxide (16 per cent), the mono-, di- and triethanolamines and ethylenediamine. All Naphtols examined gave the parent acid, except in cases where the acid component was acetoacetic acid, benzoylacetic acid or terephthaloyldi-acetic acid, when it was completely destroyed. The arylamine component was obtained in all cases.

It was found that these agents at the boil effect a smooth and continuous hydrolysis of the arylamides of hydroxycarboxylic acids into their component parts without affecting alkoxyl groups in the arylamine residue, except in the cases above noted, where the acid component was decomposed and only the arylamine obtained.

Constitutions of commercial Naphtols were confirmed or established as follows: (1) Naphtol AS-ITR, 5-chloro-2:4 dimethoxyanilide of 2-hydroxy-3-naphthoic acid; (2) Naphtol AS-OL,, o-anisidide of 2-hydroxy-3-naphthoic acid; (3) Naphtol AS-RL, p-anisidide of 2-hydroxy-3-naphthoic acid; (4) Naphtol AS-BG, 2:5-dimethoxyanilide of 2-hydroxy-3-naphthoic acid; (5) Naphtol AS-LT, 4-methoxy-2-methylanilide of 2-hydroxy-3-naphthoic acid; (6) Naphtol AS-G, diacetoacetic-o-talidide; (7) Naphtol AS-LG, bis-2:4-dimethoxy-5-chloroanilide of terephthaloyl-diacetic acid; (8) Naphtol AS-L3G, bis-4-chloro-2-methoxy-5-methylanilide of terephthaloyldiacetic acid; (9) Naphtol AS-LC, 4-chlor-2:5-dimethoxyanilide of 2-hydroxy-3-naphthoic acid; (10) Naphtol AS-L4G, 2-acetoacetylamino-6-ethoxybenzthiazole and (11) Napthol AS-GR, o-toluidide of 2-hydroxyanthracene-3-carboxylic acid.

TRACING UNDERGROUND WATER BY MEANS OF DYES

F. R. Cozzens

NOTHING stifles an oil operator's enthusiasm more completely than to find in the course of a newly-drilled well, that his pay-sand is saturated with water. Water is th natural destroyer of crude oil production. No oil-bearing formation can long withstand its ravages, but the fact is now generally recognized that the presence of water in a newly-opened sand is limited to one of two causes. Either it is seeping into the formation from abandoned wells of similar depth in the immediate locality, or it has been, through the ages, a natural replacement fluid in the sand itself. Effects from the first named cause can be controlled, since the damage is invariably localized. The second cause is hopeless because water already fills the sand reservoirs which normally contain oil. The operator, therefore, must determine to the best of his ability the source of the water, since upon his decision rests the fate of the well representing an expenditure of perhaps thousands of dollars. Having but little surface indications to guide him, he usually takes a 50-50 chance, but throughout the eastern stripper-fields, his problem is being solved for future operations by means of dyes.

The use of dyes in underground water tracing begins first with wells which are soon to be abandoned. After a well is proven no longer a profitable producer of oil or gas, the operator removes the pumping equipment, and prepares what is known in oil-field parlance as a "detector." This is made on the job by the workers themselves, and consists of one pound of dye, red or purple in color, stirred in sufficient hot water to form a paste. The mass of material is placed in a container made of waxed card-board, or similar substance which will dissolve in water. After the pack has been sealed to prevent leakage in descent, it is weighted and dropped down the well. The casing is then removed and the hole plugged in the usual manner.

During the passing months and years, any water flowing

into the abandoned reservoir at the bottom of the treated well, becomes impregnated with the dye. Should the water volume later become sufficient to push its way into the sand, that portion first receiving the dye is pushed onward and ahead. Regardless of the distance it is forced, or the time required, any new well drilled in that area will release the underground pressure, and allow the colored water to flow in. The operator then knows without a doubt that the water is local, and not a natural replacement. Colored water has frequently been recognized after forcing its way over a mile of territory in sands thousands of feet underground.

In districts where the width of an oil-stand has already been determined by drilling, it is customary for operators to treat wells on either side of the "streak" with dyes of different colors. In re-drilling the district, the new operator upon finding water, recognizes the direction from which it came. This gives him valuable information upon sand-drainage, and an accurate estimation as to the distance of his well from the center of the oil-bearing formation. The dye method proves valuable also as a speed and pressure indicator. In localities where compressed air is being utilized to force oil through underground sands, operators treat an occasional well by pouring down the casing, five to ten barrels of water which has previously been heated and dyed to a rich red color. Air pressure, ranging from 1,000 to 5,000 pounds is then turned into the well, and a record kept to determine the time required to force the colored water into receiving wells nearby. This data aids in determining the texture of a sand and its ability to hold pressure. Wells which have been aired continuously over a period of years are sometimes treated before abandonment by forcing into the sand under pressure, several barrels of heated water which has been richly colored with yellow or orange dyes. Air-channels through a sand, receive and hold the colored liquid, and are thus made easily recognized by operators who tap them in later years.

These methods, with numerous variations are giving present day operators a better understanding of oil-bearing formations. They are aiding future generations in a far greater capacity by providing evidence of operations which have previously been made.

TRADE NOTES • NEW PRODUCTS

OBITUARY

FREDERIC L. BABCOCK

FREDERIC L. BABCOCK, editor of *Fibre and Fabric*, died on March 21st at Cambridge (Mass.) Hospital after a short illness. He was 73 years old.

He was born in Old Lyme, Conn., and at one time engaged in the manufacture of medicines and had served as telegraph operator and ticket agent at Old Lyme for the New Haven Railroad before establishing a weekly paper in the community. He later developed a chain of four papers in that area.

He sold his interests there and entered the employ of the General Electric Company in Lynn, Mass., and still later was employed by the *American Wool and Cotton Reporter*.

He purchased *Fibre and Fabric* in 1907 but sold it three years later to John N. Cole, former Speaker of the Massachusetts House of Representatives. He remained as editor until his death, the publication in 1917 having been acquired by Warren Publications.

Mr. Babcock was responsible for the organization of twelve associations of production men in the textile industry in New England and one in New York and continued actively in their affairs. He was a member of the Qunicy Lodge of Elks and the East Lyme Lodge of Masons.

He is survived by his widow and one son.

• PHI PSI CONVENTION

The 37th Annual Convention of Phi Psi Fraternity will be held April 11th, 12th and 13th at the Bellevue-Stratford Hotel, Philadelphia, Pa. The following is the program of events:

Thursday, April 11th:—

6:00 P.M.—Regstration, Bellevue Roof.

Friday, April 12th:—

10:00 A.M.—Historical and industrial trips.

12:30 P.M.—Educational luncheon, speakers on industrial subjects.

1:30 P.M.—Trip to Philadelphia quartermaster depot, U. S. Army.

6:00 P.M.—Dinner.

9:00 P.M.—Grand Council officers' reception to active chapter delegates.

10:00 P.M.—Smoker and get-together.

Saturday, April 13th:—

9:30 A.M.—General meeting, Grand Council; election and installation of officers; degree to honorary members; adoption of new amendments.

1:00 P.M.—Luncheon.

2:00 P.M.—Session of executive committee of the Grand Council.

2:00 P.M.—Baseball game, Philadelphia Textile vs. Drexel Institute at Drexel Institute grounds.

7:00 P.M.—Grand Banquet, Bellevue roof.

Members have been invited to exhibit heir products on the Bellevue roof which will be open during the entire convention. A gold, silver and bronze medal will be awarded at the banquet for the three best exhibits.

It is requested that any members who have not been receiving communications from the Grand Council should contact the grand secretary, Theodore H. Thomas, 215 Washington Ave., Bennington, Vt.

• HART BULLETIN

The Hart Products Corp., 1440 Broadway, New York City, has recently released a bulletin entitled: "Mercerizing and Dypenol SE." Contents are described by the following headings:— Mercerizing; Methods of Mercerizing—Skein Process, Warp Process, Piece Goods Process; Caustic Recovery; Important Factors in Mercerizing—Strength of Caustic, Temperature of Caustic, Tension, Washing, Neutralizing, Softening, Drying; Use of Mercerizing Penetrants; Dypenol SE—Its Advantages, Directions for Use, Summary of Advantages; Common Faults in Mercerizing. There is also included a table showing comparative wetting tests of mercerizing penetrants. Copies of the bulletin are available upon request.

• SOLVENT RECOVERY SYSTEM

Carbide and Carbon Chemicals Corporation, unit of Union Carbide and Carbon Corporation, announces publication of a 32-page illustrated booklet, entitled, "Solvent Recovery by the 'Columbia' Activated Carbon System." The purpose of the booklet is to supply general information about this system of solvent recovery and

to indicate where it can be profitably employed.

The importance of solvent recovery is explained in the first chapter, which outlines the development of the use of activated carbon, describes the various grades and types of activated carbon, and mentions numerous low-boiling organic solvents that can be profitably recovered. Advantages of the system are said to include the efficiency and economy with which a moderately priced recovery plant can recover practically all types of vaporized solvents in any concentration—even in the presence of water vapor.

Other chapters discuss the equipment and operation of solvent recovery plants and describe typical applications in various industries. Information is also given regarding operating expense and the savings that these plants can effect.

The booklet also gives information about other applications of "Columbia" Activated Carbon.

Copies may be obtained from Carbide and Carbon Chemicals Corporation, 30 East 42nd Street, New York, N. Y.

• BLICKMAN BULLETINS

S. Blickman, Inc., Weehawken, N. J., has recently released two circulars of interest to the textile wet processing field. The first of these deals with the lining of wooden dye boxes with stainless steel. It is stated in the circular that this will result in the following advantages: complete elimination of boil-outs; true shades and quick color changes; non-corrosive; economical; less fabric waste; easily cleaned; fully rounded corners; solid, rigid, one-piece, welded construction; flotation boards of rounded construction; adjustable and easily removed rake pins; carrier boards which can be quickly cleaned.

The second circular is entitled "Serving the Processing Industries" and among the items featured is a thermostatically-controlled laboratory dye bath. It is stated that it incorporates electrical elements of the latest approved type, has sides and bottom insulated, and operates smoothly and efficiently with a minimum amount of care and maintenance expense.

Copies of these circulars are available upon request.

• GENERIC RAYON NAMES

The Committee on Generic Names for Rayon Fabrics, 469 Seventh Ave., New York, N. Y., which was formed to clarify generic names and definitions of rayon fabrics, announces the following names covering well known and established fabric groups:—

Twalle (pronounced Twahl)—a group of fabrics made of filament rayon, commonly known at present as pigment prints, pigment taffetas and French crepes of the type of 92 x 68 and 72 x 56. These fabrics are of plain weaves made of normal twist yarns processed with a full shrunk finish. Twalle fabrics are flat, opaque, compact, plain or printed weaves in dress, blouse and underwear weights, not sheer in texture with a soft drapey finish.

Crepe Twalle—a group of twalle fabrics in which voile twist is used in the filling, of the type of 104 x 72 made of all viscose filament rayon and of the type of 150 x 94 made with acetate filament warp and viscose filament filling. Crepe twalle fabrics are full in hand, of firm body and with greater draping quality.

Grenai (pronounced Grenay)—a group of fabrics in which the warp and filling are made of combination continuous filament yarns, consisting of a full twist viscose yarn and an acetate normal twist yarn combined, of the type of plain or novelty so-called alpaca weaves. Grenai fabrics are full-bodied dress weight weaves, soft and pliable in texture sometimes referred to as heavy sheers.

• S.O.C.M.A. MEETING

The regular monthly luncheon meeting of the Synthetic Organic Chemical Manufacturers Association was held at the Chemists' Club, New York City, on Thursday, March 14th. C. C. Concannon, Chief of the Chemical Division of the Bureau of Foreign and Domestic Commerce, was a guest and spoke briefly on the work of the Bureau. The date of the next meeting was set for Wednesday, April 17th.

• A NEW ORGANIZATION

The newly-incorporated Wm. J. Schepp Co., Inc., will continue to serve the textile industry as well as the leather, paper and other industries, with chemical specialties, pigment pastes, wetting agents, anionic and cationic compounds, synthetic resins, etc. The plant and research laboratory are located in a modern brick and concrete building at 21-23 Summit Avenue, East Paterson, N. J.

The organization will specialize in products for cotton, silk and synthetic fibers for use in printing, dyeing and finishing in the New England States and the South.

The company was formed several years ago and the recent reorganization took place the first of February. William J. Schepp will continue as president and treasurer of the organization and Fritz Aufrichtig, who recently joined the company, will be vice-president and general sales manager. Mr. Aufrichtig was for many years associated with the American Cyanamid & Chemical Corp. as a sales representative in New York and New Jersey. Emil Flory will continue as secretary and technical sales representative. Mr. Flory has been active in the dyeing and printing industry for many years, having been connected with such companies as the United Piece Dye Works and the Lyons Piece Dye Works.

The direction of research work in the laboratory, as well as supervision of the manufacturing, will be handled by Mr. Schepp who has devoted a period of years in the development of wetting agents, permanent finishes, washable fast white pigment printing pastes, synthetic resin emulsions, chemical resistant lacquers and other products.

• POWER MIX

The latest model of the "Power-Mix" is now supplied with a Monel support arm which fits into any clamp and allows the mixer to be adjusted at any angle whatsoever.

It is stated that the new "Power-Mix" differs from most laboratory mixers because its extra power (made possible by special gearing) enables it to run continuously on the heaviest fluids such as glues, lacquers, paints, asphalts, heavy oils, syrups, food products, pharmaceuticals, latex, etc. Full power is developed at even the lowest speeds. Its speed may be varied from 0 to 1350 R.P.M. It is claimed that exhaustive tests in many laboratories have shown that it consistently outlasts most mixers under the most rigorous conditions, that it cannot be injured by overloading and is explosion-proof when used with hazardous liquids, and that it requires no lubrication and will run 24 hours continuously without damage. The new unit will run on either A.C. or D.C.. It is sold through the Chemical Publishing Co., Inc., 148 Lafayette St., New York City.

• INTERNATIONAL NICKEL EARNINGS

The report of The International Nickel Company of Canada, Limited, and subsidiaries for the year ended December 31, 1939, just issued by Robert C. Stanley, Chairman and President, shows a net profit after all charges of $36,847,466, equivalent after preferred dividends to $2.39 per share on the 14,584,025 no par shares of common stock outstanding.

This compares with a net profit of $32,399,470 or $2.09 a common share for 1938 and $50,299,623 or $3.31 a share, the all-time high earnings established in 1937.

• JOINS WARWICK

Raymond Pingree has joined the technical staff of Warwick Chemical Company as chief chemist. Mr. Pingree has had a great deal of practical experience through his connections with Sayles Finishing Company and U. S. Finishing Company as well as his connection with the Fine Chemicals Division of the du Pont Company. Mr. Pingree is also known through his activity with the A.A.T.C.C. where he served for a number of years as secretary of the Rhode Island Section.

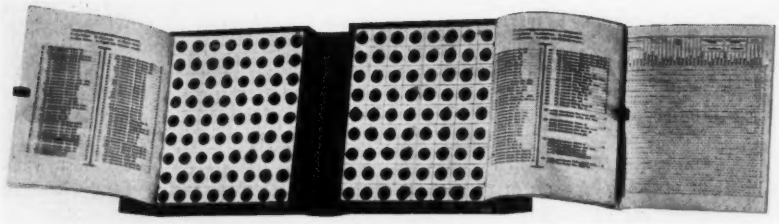

Photo above shows new Calco shade card

• NEW CALCO SHADE CARD

A new shade card has just been issued, with information whose extent and accuracy are claimed to exceed that of any previously available. Produced by the Calco Chemical Division of American Cyanamid Company it includes as an integral part specific and detailed discussions of each of the three methods of dyeing loose wool; top chrome, metachrome and chrome bottom.

Actual dyeings are shown in this card for 144 Calco wool shades, plus 42 explanatory and comprehensive tables giving fastness properties for every use for which these dyes are suitable.

These tables are arranged in the same order as the dyed patterns, and the fastness properties are in alphabetical order. In arriving at the conclusions stated the methods of the American Association of Textile Chemists and Colorists were used as far as they have been established. In all other cases Calco used its own methods. The degree of accuracy obtained in the rating is indicated by the fact that more than 5,000 dyeings and tests were made, thus eliminating guesswork almost completely.

Calco asks that no mail or telephone requests be made, due to the limited number of copies available, although each Calco representative has been supplied with an allotted amount.

• RESIGNS FROM WARWICK

Harold W. Rose has resigned as sales manager of Warwick Chemical Company as well as Vice-President of the Impregnole Corporation, a subsidiary of the Warwick Chemical Company.

• NEW NOPCO PRODUCTS

Two new developments in the sizing of yarns of cut staple rayon, acetate and wool combinations of these yarns were disclosed recently by laboratory technicians of the National Oil Products Co., of Harrison, N. J.

Trade-named Nopco 1111 and Nopco 1227-B, both new products are "non-hygroscopic softeners" used in the sizing mixture.

Among the advantages claimed for Nopco 1111 and Nopco 1227-B are reduced shedding, increased flexibility and elasticity imparted to the size film, superior lubrication for yarn surfaces and elimination of brittleness in warp yarn.

Chemists who developed the products also contend their use will increase loom production through fewer stops for warp breaks, in addition to increasing the tensile strength of the yarn and facilitating removal of the size and handling in the slasher room.

• MARCH TEXTILE RESEARCH

Of particular interest to wool manufacturers is the report of a research on "The Sampling of Domestic Wool for Shrinkage Determination" that appears in the March issue of *Textile Research*. It is a progress report on a project directed by the author, Dr. Robert H. Burns, wool specialist, University of Wyoming Experiment Station, while he was a member of the staff of the U. S. Department of Agriculture.

The initial report of a fundamental study of the chemical groups of wool protein that are capable of combining with acids and bases is started in *Textile Research* for March under the title "Combination of Wool Protein with Acid and Base: Hydrochloric Acid and Potassium Hydroxide." It is a Textile Foundation study under the direction of Dr. Milton Harris. This report appeared in the March 4th and 18th issues of the AMERICAN DYESTUFF REPORTER.

• GIVAUDAN-DELAWANNA TO MOVE

After May 20th the executive offices and service laboratories of Givaudan-Delawanna, Inc., will be located at 330 West 42nd Street, New York, N. Y.

Larger quarters are required because of the growth and development of the organization which in conjunction with its affiliated establishments abroad is said to be one of the largest producers of aromatic chemicals and perfume materials in the world.

• W. B. LAWSON, INC.

William B. Lawson, formerly of The Harshaw Chemical Company and The International Nickel Company, announces the formation of W. B. Lawson, Inc., dealing in industrial chemicals, oils, and non-ferrous metals. Offices are in the Union Commerce Building, Cleveland, Ohio.

Mr. Lawson joined the Harshaw organization in 1930 and resigned on January 25th, this year. Previous to joining that company Mr. Lawson was for many years with The International Nickel Company holding various executive positions. When he resigned from International in 1930 he was Director of Sales, which position he had held for several years.

According to Mr. Lawson, President, the new company offers a personalized buying and selling service based on his years' of experience, his broad contacts in chemical and metal trades and a highly specialized knowledge of many markets.

• LOWELL TEXTILE SHOW

The annual show and dance of the Lowell Textile Players, of the Lowell Textile Institute, Lowell, Massachusetts, will be held Friday, April 26, 1940, at the Rex Auditorium.

"The Bishop Misbehaves," a three-act comedy by Frederick Jackson, has been selected for the play, with a cast of seven men and two "women." Prof. Elmer E. Fickett, Faculty Adviser, and H. Russell Cunningham, '40, President of the Players, are in charge of the show, with Charles J. Keyes serving for the eleventh year as coach.

• LECTURE ON CORROSION

The annual lecture before the Toronto Chemical Association, sponsored by the Ontario Research Foundation, was delivered this year on Tuesday evening, March 19, by F. L. LaQue of the Development and Research Division of The International Nickel Company, Inc.

The subject of the lecture was "Corrosion and Corrosion Processes." The lecture included a discussion of the theoretical aspects of corrosion and of the factors which determine its progress. Incidental topics covered were electrolytic effects, including galvanic relationships between alloys in their active and passive states, the effects of surface finish and stress, corrosion fatigue, and peculiar types of corrosion that are associated with particular metals and alloys. The lecture was illustrated by means of slides.

Mr. LaQue has been associated with the International Nickel Company since 1927, devoting his activities to the field of corrosion and corrosion resisting materials. He was educated at Queen's University at Kingston, Ontario, Canada, where he received a degree of Bachlor of Science in Chemical and Metallurgical Engineering.

• TO REPRESENT NEW YORK SECTION

Dr. Donald Price, chief research chemist for the National Oil Products Co., of Harrison, N. J., will represent the New

York Section at the Spring meeting of the American Chemical Society in Cincinnati, Ohio, April 7th to 11th.

Dr. Price was elected a Councilor for the New York Section for the year ending January 1st, 1941. He is a graduate of Columbia University, Class of 1924.

• DU PONT RELEASES

Two new vat colors have been announced by the Dyestuffs Division of E. I. du Pont de Nemours & Company:

"Leucosol" Red B Paste—a new anthraquinone type vat color which produces bluish shades of red on cotton and viscose process rayon. It is very fast to 2° Bé. chlorine and power laundering with chlorine, the company says. The color may be used for printing drapery materials since it is said to be very fast to light in medium to heavy shades. It is satisfactory for self shades, for rose, wine, bordeaux and maroon combinations and as a base for light and dark rusts, according to the company.

"Ponsol" Brilliant Violet 3B Paste—a new vat color which produces bright bluish shades of violet on cotton and viscose process rayon. It is recommended by the company for printing and for dyeing by the reduced and pigment-pad methods and for use in pressure type dyeing machines. The new color possesses very good fastness to peroxide bleaching, cross-dyeing, perspiration and laundering with and without chlorine and shows good resistance to light and chlorine bleaching, the company says. It will be used to produce reddish shades of blue on drapery fabrics because of its fastness to light.

• SURVEY ON TEXTILE TRAINING

The directors of the Textile Foundation have authorized a special survey and brief report of the possibilities of providing for graduates of engineering schools and colleges who have not been previously associated with the textile industry, a year of training for the textile industry. It is proposed that the report will summarize the facts with regard to the needs of such a textile industry preparatory training. The original report on the Training of Men for the Textile Industry indicated the possibility of developing a textile industrial preparatory course, which might be given in one or more textile schools to those men who have graduated at colleges or universities where textile instruction was not available.

The proposed survey will include an inquiry into the possible number of persons desiring such training and suggestions as to the best form that such a training may take. The proposal does not contemplate a post-graduate year in the ordinary sense, but rather an organized vocational guidance course for young men desiring to enter the textile industry, but who are not acquainted with its general organization and production and sales practices. The inquiry is in charge of Thomas R. Taylor, a graduate engineer and economist, of Washington, D. C., and will be conducted in cooperation with leaders of the textile industry and of textile education as has been the case in other surveys undertaken in the field of education by the Foundation. Mr. Frederick M. Feiker, Dean of the School of Engineering of George Washington University, and Educational Consultant for the Textile Foundation, will cooperate with Mr. Taylor in the development of the special report.

The Textile Foundation was organized for scientific and economic research for the benefit and development of the textile industry, and its allied branches including that of production of raw materials. It is managed by a Board of Directors consisting of Franklin W. Hobbs of Boston; Frank D. Cheney of New York, Stuart W. Cramer of Cramerton, N. C., and the Secretaries of Commerce and Agriculture.

• DEVELOPMENTS AT CALCO

A new and important addition to the powerhouse at the Bound Brook plant of the Calco Chemical Division of American Cyanamid Company now nearing completion will increase ground area to 20,000 square feet. It is stated that, necessitated by larger production requirements, this expansion furnishes additional evidence of the strong position occupied by the U. S. dyestuff industry today. One new steam generator being installed will develop 120,000 pounds of steam per hour. Total consumption of fuel amounts to seven carloads of coal daily. Turbo-generators will develop enough electricity to supply a city of a quarter of a million people.

It is said that engineers who have inspected this plant report it as one of the most efficient in the United States, with one of the highest power production ratios of any industrial plant in the country.

• STUDENTS' TEXTILE EXPOSITION

Raymond J. Payne of Kannapolis and H. C. Woodall, Jr. of Smithfield attained the highest honors which Textile students at North Carolina State College can secure at the hands of their fellow students, when they were recently elected superintendent and assistant superintendent, respectively, of the 1940 Students Textile Exposition, which will be held in connection with the State College Style Show on April 25. During the present year these two young men are serving as student assistants in the weaving department and have been prominent in other campus activities, Mr. Payne being president of Phi Psi Textile fraternity, while Mr. Woodall has headed the Tompkins Textile Society. Mr. Payne is a son of M. M. Payne, superintendent of weaving at Cannon Mills, and a brother of M. B. Payne, also of Cannon Mills, who was superintendent of the 1937 Students Textile Exposition.

Other Textile students who were elected to offices in the 1940 Exposition were: Foreman of Yarn Manufacturing, Ernest Rogers, Concord, N. C., Asst. Foreman of Yarn Manufacturing, E. W. McLeod, Carthage, N. C., Foreman of Knitting, F. L. Misenheimer, Salisbury, N. C., Asst. Foreman of Knitting, Bill Friday, Dallas, N. C., Foreman of Weaving, John Mauney, Lincolnton, N. C., Asst. Foreman of Weaving, J. T. Shotwell, Henderson, N. C., Foreman of Designing, E. D. Kearns, Greensboro, N. C., Asst. Foreman of Designing, J. E. Odegaard, Montclair, N. J., Foreman of Dyeing, C. K. Watson, Red Springs, N. C. and Asst. Foreman of Dyeing, F. M. Clements, Greensboro, N. C.

• NYLON HOSIERY

A number of manufacturers of full fashioned hosiery are now engaged in making stockings of nylon yarn, it was announced recently by the du Pont Company. Limited quantities of nylon hosiery are expected to be on sale in retail stores throughout the country on or about May 15. The du Pont Company, which discovered and developed the new nylon materials, does not make stockings, but manufactures the yarn in its new plant at Seaford, Delaware.

The plant has been in operation only since December 15. Present production is about 30 per cent of the ultimate capacity. Because of the time necessary to install machinery and to give employes a thorough training in the manufacture of this new product, it probably will be late Summer before capacity production of approximately 4,000,000 pounds of yarn a year, will be reached.

So far as other uses for nylon are concerned, the announcement said that aside from brush bristles, fishing lines and leaders, surgical sutures, sewing thread, and a few other articles now being sold, which require small amounts of nylon for manufacture, it probably would be some time before production facilities and other factors would permit other large scale developments, particularly in the textile field. While experiments with nylon fabrics and other materials have shown that it would be possible for women to dress from head to foot in nylon, the present demands from full fashioned hosiery manufacturers preclude immediate large scale development along these lines. Research into new uses for nylon is continuing.

• NEW CLEANING METHOD

Announcement has been made by the Bigelow-Sanford Carpet Company of a

new cleaning method created by the company's Technical Department. This new cleaning agent will be known as "Dri-Sorb-Ene."

Drisorbene was developed to combine the safety of the dry cleaning method to both texture and color with the thoroughness of professional rug and upholstery cleaning, using standard equipment. It is a dry, absorbent cleaner said to be harmless to all fabrics and dyestuffs and is recommended by the manufacturers for use wherever soap or wet cleaning may be injurious.

With the introduction of hard twist and other texture-type fabrics, the professional rug cleaner was faced with many new problems in addition to his former difficulties with fugitive colors and shrinkage and the problem of how to clean tacked down carpet economically and safely. Drisorbene was originally developed to fill the need for a safe, effective method of cleaning fabrics containing hard twist yarns, but, it is said, experience has now shown that its uses are practically unlimited.

• CHEMICAL TRADE

United States exports of chemicals and related products continued at record levels during January, while imports of these products maintained relatively high levels during the same month, the Chemical Division of the Commerce Department reported recently. With most items showing up to 100 per cent increase over shipments for the corresponding month of 1939, January exports were valued at $20,432,000, as compared to $10,700,000 in the first month of last year.

The trend which has been noted in increased receipts of chemical raw materials, including drying oils, since the outbreak of hostilities in Europe continued in January. Total value of these materials during the month amounted to $16,975,000, compared with $15,705,000 in December 1939, and $14,831,000 in January 1939.

Since the outbreak of war in September, exports of chemicals have amounted to $107,300,000 as compared with $67,665,456 in the five corresponding months of 1938-1939.

Comparing January's exports with those of January 1939, spectacular gains are noted in medicinals, pharmaceuticals, coal-tar dyes, chemical specialties, sulphur, naval stores and industrial chemicals.

Coal-tar exports for the month were valued at $2,895,000 as compared with $1,081,500 in January 1939. In this group, shipments of coal-tar dyes and related lines rose from 661,000 to 2,685,750 pounds and increased in value from $304,000 to $1,126,000. Benzol exports, also in the coal-tar group, experienced a sharp rise from 1,945,000 gallons to 3,097,750 gallons, and increased in value from $301,400 to $598,500.

• TO MOVE SALES OFFICES

Lustre Fibres Limited, selling agents for the American Viscose Corporation, now at 200 Madison Avenue, New York, will move their sales offices on or about May 1 to the Empire State Building, 350 Fifth Avenue, New York, it is announced by W. B. Olmsted, general sales manager.

It is also announced that a branch sales office, situated in the New York office, has been established for the New York district. The area of the new branch office will cover Northern New Jersey and all of New York State including New York City. J. H. Hammes, formerly assistant manager of the Viscose Process Division has been appointed manager of this New York branch; he will be assisted by R. N. Semler.

• BOOK REVIEWS •

"Textile Fibers and Materials"—*Their Properties and Identification with Special Reference to Rayon and Staple Fiber, by Richard Hunlich. Translated by A. J. Hall and H. P. Curtis. 222 pages, 122 illustrations. Thomas Skinner & Co., Ltd., Publishers. Price 8s. 6d. net. London, England.*

Recent years have witnessed the development of a great interest, on the part of consumers and distributors of textile materials, in learning more in regard to the properties of textile fibers, the construction of fabrics, and in a general way the methods of their production. This has been particularly true since the introduction of the various rayons, in the continuous filament form, and more recently in the form of cut or staple fibers. This book has been published to fill the requirements of those who wish to gain such a general knowledge without going into too much detail.

The text is divided into three sections:

(1) The textile fibers (raw materials).
(2) Manufacturing methods as applied to fibers.
(3) Testing and identification of textile materials.

The numerous illustrations add greatly to the comprehensiveness of the text.

The book will be found of value to a great variety of persons such as mill managers and operatives; clothing manufacturers; laundry operators, and students.

"Sulfated Oils and Allied Products" — *Their Chemistry and Analysis, by Donald Burton, M.B.E., D.Sc., F.I.C., and George F. Robertshaw, A.M.S.T., A.I.C. 1940. 168 pages. Chemical Publishing Co., Inc. 148 Lafayette Street, New York, N. Y. Price* $5.00.

Sulfated or Sulfonated Oils as they are usually called are very closely associated with the textile industry and the work of the textile chemist.

The introduction of sulfonated castor oil more than sixty years ago for use in the dyeing and finishing of cotton textiles laid the foundation for a new industry which has developed extensively since that time. About every kind of oil both vegetable and animal has been sulfonated with varying degrees of success and a variety of them are extensively used as wetting and emulsifying agents.

The text is divided under six headings:

I. Historical Survey and References.
II. Raw Materials and Methods of Sulfation.
III. Chemistry of Sulfation.
IV. Analysis of Sulfated Oils.
V. Analysis of Sulfated Fatty Alchools.
VI. Analysis of Petroleum Sulfonic Acids.

T. P. Hilditch, D.Sc., F.I.C., states in an Introductory Preface, "In my opinion, the collection and critical survey of these analytical procedures makes this monograph serve two useful purposes. It brings together all the data which are at present available to the technical analyst; and the reasoned criticisms, of each method discussed and the subject as a whole, should make the book of definite service in promoting the further research which is clearly

equired before the chemical control of many of these roducts can be regarded as worthy of their industrial mportance. It is a pleasure to be invited to contribute a refatory note to a volume written with so much conructive purpose."

This book will fill a long felt need of textile chemists, or information in a field which has not as far as we know een brought together in one book.

"How to Buy, Sell and Burn Coal," *by Thomas A. Marsh, Author of Combustion in the Power Plant. Published by T. A. Marsh, 5625 Kenwood Ave., Chicago, Ill. 7 pages. Single copy* $1.00—*10 to 24 copies ninety cents 25 or more copies eighty cents, including U. S. postage.*

Mr. Marsh is known and recognized as an authority n fuels, furnaces, stokers and combustion. His broad xperience embraces actual tests and operations as well s design of practically all types of fuel burning equipment om central station equipment to small domestic units. e has been granted numerous patents on stoker design nd has contributed much to the present literature on mbustion. Mr. Marsh tells in clear and non-technical nguage, giving examples and reasons:

How to select coal for manufacturing plants, for commercial heating plants and even for residential use;
How to cut fuel bills;
How to stop smoke;
How to increase efficiency;
How to increase steam output;
How to size stoker coal;
How to "read fires";
How to "shoot trouble" on coal and stokers;

ne section is a complete schematic analysis of Causes d Remedies of scores of fuel burning difficulties, of eat value to service engineers on fuels or stokers or as a anual for operating engineers.

This book is a valuable aid to buyers of coal for actual age or for resale. Anyone having to do with actual al burning or stokers will naturally use it for reference service, "trouble shooting" and combustion work.

"Vegetable Dyes," *by Ethel M. Mairet. 68 pages. merican edition published by the Chemical Publishing ompany, Inc., New York, N. Y. Price* $2.00. 1939.

This book is described by the publishers as a book of cipes and other information useful to the dyer. The rst chapter is devoted to a discussion of the various types wool, silk, cotton and linen materials which may be ed, and the remainder of the book to the mordanting d dyeing of these materials with natural dyes. Except the glossary no mention is made of coal-tar dyes.

This book is primarily of importance to those interested arts and crafts pursuits and in the study of the methods dyeing used in the earlier days before coal-tar dyes ere introduced, which unless war conditions become such at we have to return to the use of natural vegetable dyes a period of time the book is of no great interest to the odern commercial dyers.

"Where to Find the New Trade Names"— *A Bibliography, compiled by Alice M. Amoss, Librarian, Technical Library, Edgewood Arsenal, Maryland. 32 pages. 1939. Price 75 cents.*

As far as we know this is the first bibliography classified by subjects on trade names which has been published.

The widespread use of trade names in current literature often presents a problem to both research men and purchasing agents. Many products are discussed and sold under brand or trade names which give no indication of their characteristics or composition. The products of one manufacturer may or may not be similar to those of his competitor and the trade names may offer no suggestions.

It is often necessary to know where to find information as to properties of the product, its possible uses, and the sources from which it may be obtained. It is with this need in mind that the following compilation has been made. The compiler does not claim that this bibliography is complete. The references listed, however, may suggest other sources of information which are readily available to the searcher. American products have been stressed in this paper, with a few references to the literature on foreign names.

This bibliography is classified first as to subjects of which there are more than one hundred covered. Of these the following may be of interest to the readers of the DYESTUFF REPORTER: Chemical Apparatus, Chemicals, Detergents, Clothing, Drugs and Pharmaceuticals, Dyes, Emulsifying Agents, Gums, House Furnishings, Ink Removers, Laundry Equpiment, Plastics, Rayon, Resins, Rugs, Solvents, Textile Chemicals, Textile Processing Equipment and Supplies, Textiles, Upholstery and Furniture, Wearing Apparel, and Wetting Agents.

"Chemicals of Commerce," *by Foster Dee Snell, Ph.D., and Cornelia T. Snell, Ph.D.* 541 *pages. D. Van Nostrand Company. Price* $5.00.

How frequently chemists and others wish to ascertain quickly the properties and uses of some particular product used industrially or medicinally and are unable to do so from any book they may have in their library. To such this book will be found of value many times. Approximately thirty-five hundred commercial products are well indexed and described with sufficient detail to give in many cases all the information that may be desired. In many instances commercial information is given which would not be found in the more comprehensive encyclopedia.

The material is listed under thirty-seven chapters, each of which covers special groups or types of products. This has two advantages; one cannot only readily locate the type of product he is looking for but at the same time find information for a basis of comparison with products of a similar nature or for a similar use. This book will serve well as an accompaniment to one of the excellent handbooks of chemistry which are available at the present time and should be in every chemist's library.

"Faces We See." *Mildred G. Barnwell. Published by Southern Combed Yarn Spinners Association, Gastonia, N. C. Price* $3.00.

This book, which consists of some hundred or more excellent photographs, a number of which are full page or double page in size, gives graphic information regarding the textile industry in the South, accompanied by some text material.

The real story of life in a southern cotton mill village has now been told. In "Faces We See," Mrs. Barnwell presents a series of remarkable photographs, all taken from real life, showing just how the employees spend their leisure time; just what community facilities are provided for them by the mill companies; and just what the jobs of these people inside the mill are. The text which accompanies the photographs is brief, interestingly written, and factual.

The combination of the text and pictures represents a complete answer to the many distorted stories of living and working conditions in southern mills which have appeared in national publications in recent years. It is a story which will be of absorbing interest not only to the employers and employees in the southern textile industry itself, but to all other southerners, and to those engaged in similar work throughout the country, as well as to all interested in the social-economic problem.

Mrs. Barnwell's book consists of three main chapters, each containing a series of superb photographs. Chapter I—"Southern Mill Folk"—tells the story of the background of the southern mill workers, of that thrilling social transformation which followed the trek of so many thousands from mountain to mill. Then the pictures in this section show just how these people live today—what they do with their leisure time, and what facilities for living the mills provide for them.

The second chapter, "From Bale to Bolt," takes the layman through a cotton mill, shows him every step in this intricate series of processes, and explains them all simply and clearly.

The third chapter, "Meet the Reeses," completes this pictorial journey by going behind the scenes with one actual mill family, and portraying the events of a day in the life of that family.

Finally, a fourth section, "Combed Yarn Mill Facts," gives the reader additional information on the industry itself: where its money goes, how its wage rates stand, the background of labor legislation in North Carolina, etc.

The book is being widely distributed among key members of the public, editors and reviewers, libraries, and other agencies whereby public opinion is moulded. It is available at the office of the Southern Combed Yarn Spinners Association, Gastonia, N. C., of which Mrs. Barnwell is executive secretary.

The photographs were taken by Bill Baker, of the North Carolina Department of Conservation and Development, under the direction of Mrs. Barnwell. The negatives are on file with the News Bureau of that Department, at Raleigh, N. C., and copies may be had upon request.

• CLASSIFIED • ADVERTISEMENTS

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